Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-122. (canceled)

123. (Currently amended) ~~Apparatus~~ An apparatus for detecting clinically-relevant features of a gastrointestinal (GI) tract of a subject, comprising:

a capsule, adapted to be swallowed by a subject, said capsule including ~~and comprising~~:

at least one radiation source~~, adapted to emit~~ emitting X-ray or gamma radiation having an energy of at least 10 keV; [[and]]

at least one radiation ~~photon~~ detector detecting radiation produced in response to the ~~, adapted to detect photons generated responsively to the~~ emitted radiation, said at least one radiation detector detecting radiation having an energy in a first energy window corresponding to Compton-backscattered radiation and concurrently therewith detecting radiation having an energy in a second energy window corresponding to X-ray fluorescence (XRF) radiation from an X-ray contrast agent composition, said X-ray contrast agent composition introduced in the GI tract and consisting essentially of a stable, non-radioactive isotope~~, the photons having an energy of at least 10 keV;~~

~~a radiopaque oral contrast agent, adapted to be administered to the subject~~; and

a control unit~~, adapted to analyze~~ which analyzes signals from the concurrently detected Compton-backscattered radiation and the XRF radiation and ~~data regarding the photons in order~~ to generate information useful for identifying a clinically-relevant feature of ~~a gastrointestinal (GI)~~ the GI tract of the subject.

124. (Currently amended) The apparatus according to claim 123, wherein the contrast agent composition comprises an agent having a high Z adapted to be swallowed by ~~administered to~~ the subject.

125. (Previously presented) The apparatus according to claim 123, wherein the radiation source comprises a radioisotope.

126. (Currently amended) The apparatus according to claim 123, wherein the radiation source comprises at least one collimator which collimates ~~, adapted to collimate~~ the radiation emitted by the radiation source.

127. (Currently amended) The apparatus according to claim 123, wherein the photon detector comprises at least one collimator which collimates ~~, adapted to collimate~~ the radiation ~~photons~~ detected by the radiation ~~photon~~ detector.

128. (Currently amended) The apparatus according to claim 123, wherein the control unit ~~is adapted to distinguish~~ computes a ratio between Compton scattered radiation and X-ray fluorescence radiation signals for distinguishing between gas in the GI tract and the clinically-relevant feature.

129. (Canceled)

130. (Canceled)

131. (Previously presented) The apparatus according to claim 123, wherein the useful information includes an ~~control unit is adapted to~~ estimate of a distance from a site of the capsule to a wall of the GI tract.

132. (Canceled)

133. (Currently amended) The apparatus according to claim [[132]] 131, wherein ~~the control unit is adapted to estimate~~ the distance ~~by estimating a depth of the contrast agent between the site of the capsule and the wall of the GI tract responsively to the analysis~~ is estimated from an intensity measurement of the Compton backscattered radiation ~~photons~~.

134. (Currently amended) The apparatus according to claim 131, wherein the distance is estimated from an intensity measurement of the ~~control unit is adapted to analyze~~ X-ray fluorescence (XRF) radiation ~~photons~~ generated ~~responsively~~ responsive to the emitted radiation.

135. (Currently amended) The apparatus according to claim 123, wherein the radiation source emits ~~is adapted to emit~~ the radiation from the capsule only during a portion of a time that the capsule is in the GI tract.

136. (Currently amended) The apparatus according to claim 135, wherein the capsule comprises a sensor, adapted to sense a parameter indicative of possible imminent motion of the capsule in the GI tract, and wherein the radiation source emits ~~is adapted to emit~~ the radiation ~~from the capsule responsively~~ in response to [[the]] sensing [[of]] the parameter by the sensor.

137. (Currently amended) The apparatus according to claim [[135]] 140, wherein ~~the radiation source comprises a radioisotope, wherein~~ the capsule comprises a ~~radiation shield, and wherein the capsule comprises~~ an actuator [[,]] adapted to move at least one of the radiation source and the shield, such that the radiation shield does not block the radiation emitted from the radiation source during the portion of the time.

138. (Previously presented) The apparatus according to claim 123, wherein the capsule comprises an inflatable balloon, adapted to inflate around the capsule.

139. (Currently amended) The apparatus according to claim 123, wherein the at least one radiation ~~photon~~ detector comprises a plurality of radiation ~~photon~~ detectors, arranged to detect radiation ~~photons~~ arriving from a plurality of respective detection directions.

140. (Previously presented) The apparatus according claim 123, wherein the capsule comprises at least one radiation shield.

141. (Currently amended) The apparatus according to claim 140, wherein the at least one radiation shield is configured to prevent radiation from being emitted from the radiation source in directions other than a single confined solid sector relative to a sphere surrounding the capsule.

142. (Previously presented) The apparatus according to claim 123, wherein the clinically relevant feature includes a pathological abnormality of the GI tract.

143. (Previously presented) The apparatus according to claim 142, wherein the pathological abnormality includes a polyp.

144. (Previously presented) The apparatus according to claim 123, wherein the control unit is adapted to detect that the capsule has reached an area of clinical interest within the GI tract.

145. (Currently amended) The apparatus according to claim 144, wherein the control unit includes means for preventing ~~is adapted to withhold the~~ emission of radiation by the radiation source until the capsule has reached the area of clinical interest.

146. (Currently amended) The apparatus according to claim 145, wherein the control unit includes means for preventing ~~is adapted to withhold the~~ radiation ~~photon~~ detector from detecting radiation ~~photons~~, and [[to]] for preventing ~~withhold the~~ control unit from analyzing the data, until the capsule has reached the area of clinical interest.

147. (Canceled)

148. (Currently amended) The apparatus according to claim 144, wherein the capsule comprises a pressure sensor, and wherein the control unit detects ~~is adapted to detect~~ that the capsule has reached the area responsively to a change in pressure detected by the pressure sensor.

149. (Canceled)

150. (Canceled)

151. (Canceled)

152. (Currently amended) The apparatus according to claim 123, wherein the capsule comprises at least one extending element, which ~~adapted~~, when extended, ~~to maintain~~ maintains the capsule at least a certain distance from a wall of the GI tract.

153. (Currently amended) The apparatus according to claim 123, wherein the capsule comprises at least one extending element, which ~~adapted~~, when extended, ~~to orient~~ orients a long axis of the capsule generally parallel to a longitudinal axis of the GI tract.

154. (Currently amended) The apparatus according to claim 153, wherein the extending element comprises an expandable flexible chamber, wherein the flexible chamber comprises a super-absorbent hydrogel, and wherein the flexible chamber ~~is adapted to expand~~ expands when the hydrogel absorbs liquids from the GI tract.

155. (Currently amended) A method for detecting clinically-relevant features of a gastrointestinal (GI) tract of a subject, comprising:

orally administering to a subject a radiopaque [[oral]] X-ray contrast agent composition consisting essentially of a stable, non-radioactive isotope ~~to a subject~~;

orally administering to a subject a capsule emitting X-ray or gamma~~, from within a gastrointestinal (GI) tract of a subject,~~ radiation having an energy of at least 10 keV;

~~detecting~~ measuring, from within the GI tract, concurrently in a first energy window a first radiation signal ~~photons~~ generated responsively to the emitted X-ray or gamma radiation, said measured first radiation signal representing collimated Compton-backscattered radiation, and in a second energy window a

second radiation signal representing X-ray fluorescence (XRF) radiation from the X-ray contrast agent~~, the photons having an energy of at least 10 keV~~; and

analyzing ~~data regarding~~ the ~~detected~~ measured first and second radiation signal to identify ~~photons in order to generate information useful for identifying~~ a clinically-relevant feature of the GI tract.

156. (New) The apparatus according to claim 123, wherein X-ray contrast agent composition comprises a composition selected from a barium sulfate-based compound, an iodine-based compound, and a gadolinium-based compound.

157. (New) The apparatus according to claim 123, wherein X-ray contrast agent composition comprises a composition selected from Tantalum, Gadolinium, Thorium, Bismuth, and compounds thereof.

158. (New) The apparatus according to claim 141, wherein the at least one radiation detector is arranged for detection of Compton-backscattered radiation at an angle of 180° ± 30° relative to the angle defined by the solid sector.

159. (New) The method of claim 155, wherein the clinically-relevant feature of the GI tract comprises a polyp or another comparable anatomical abnormality, further comprising identifying the polyp or anatomical abnormality from a decrease in the second radiation signal from the XRF radiation accompanied by an increase in the first radiation signal from the Compton-backscattered radiation.

160. (New) The method of claim 155, further computing a ratio between the measured first radiation signal from Compton-scattered radiation and the measured second radiation signal from XRF radiation, and differentiating between gas pockets and polyps based on the computed ratio.

161. (New) A capsule adapted to be swallowed by a subject, for detecting clinically-relevant features of a gastrointestinal (GI) tract of a subject, comprising:

at least one radiation source emitting X-ray or gamma radiation having an energy of at least 10 keV, said X-ray or gamma radiation passing through an X-ray contrast agent composition consisting essentially of a stable, non-radioactive isotope and disposed in the GI tract between the capsule and a wall of the GI tract; and

at least one radiation detector comprising at least one collimator and detecting in a first energy window collimated X-ray fluorescence radiation from the X-ray contrast agent composition excited by the emitted radiation, and detecting in a second energy window Compton-backscattered radiation from the

X-ray contrast agent and the wall of the GI tract produced in response to the emitted radiation; and

a control unit configured to analyze data regarding the detected X-ray fluorescence radiation and Compton-backscattered radiation to identify a distance between the capsule and a wall of the GI tract, said distance representative of clinically-relevant feature of the GI tract.